Utilization of steam-treated oil palm fronds in growing Saanen goats: II. supplementation with energy and urea

ABSTRACT

The objective of this study was to evaluate the effect of protein and energy on goats fed oil palm fronds (OPF) as roughages. Twenty-four male Saanen goats aged between 7 and 8 months and weighing 23.4±1.6 kg were used in a 2×3 factorial design. Factors were three levels of urea (3%, 4% or 5%) and two levels of energy (low energy (LE) or high energy (HE)). On average, all parameters measured, including dry matter intake (DMI), nutrient digestibility, digestible nutrient intakes, ruminal ammonia-N (NH3-N), ruminal total volatile fatty acid (total VFA) and individual VFA concentrations (mM/L), microbial N supply, P/E ratio and N retention were higher for HE compared to LE diets. Significant ($p<0.05$) interactions were found between levels of urea and energy for non-structural carbohydrate (NSC) and energy (DE) digestibilities, ruminal NH3-N and total VFA concentrations. HE diets had higher N absorption and retention than LE diets. Interactions between urea and energy for plasma urea nitrogen (PUN), heat production (HP), and urine and faeces N excretion were significantly lower ($p<0.05$) for the HE diets than those recorded for the LE diets. The results indicated that supplementation of energy enhanced utilization of urea and resulted in higher animal performance as a consequence of improved ruminal fermentation, microbial yield and N balance. However, the optimal level of urea supplementation remained at 3% in the HE diet.

Keyword: Fermentable energy; Microbial N supply; Oil palm fronds; Saanen goats; Urea